April 2017

The New North: Patents and Knowledge Economy in Alaska

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The New North:
Patents and Knowledge Economy Analysis in Alaska

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Introduction

- Alaska, as many other northern regions, is not typically considered a ‘hotbed’ of knowledge economy.
- The petroleum sector and the government play the commanding role in the state’s economic structure.
- Lowering oil prices, diminishing production and government budget cuts ignited a discussion about “other options” and “new money” for Alaskan economy.
- The modern economic development theories suggest that investment in knowledge-based economy and human capital is necessary.
- Geographic proximity between people and organizations that create knowledge is still in the core of region’s ability to nurture a successful regional innovation system.

➢ Knowledge gaps:

- Little knowledge about spatial distribution of patents and typological characteristics of innovation in Alaska.

- Limited understanding of external and internal innovation networks within the Alaska Regional Innovation System (AKRIS).

- Possible factors that influence innovation activities in Alaska and the relationship between innovation, creative capital and economic development in Alaska have not been examined

The Research Objectives and Goals

- **Goal:** Analyze the knowledge economy in Alaska and elucidate its role in the economic development in the area.

- **Research objectives:**

- Determine the spatial distribution of patents, temporal dynamics and typological characteristics of innovation in Alaska.

- Elucidate the external and internal innovation networks within Alaska Regional Innovation System (AKRIS).

Why Patents in Alaska?

- In Alaska, there have been very few studies of knowledge economy and creative economy.
- Knowledge is expected to add a substantial value to economic production though enhancing the productivity and merging of new ideas and technology.
- Patents are usually considered as a good measure of knowledge economy.
- This study uses patents to provide the first cut analysis of knowledge economy in Alaska and clarify its role in the economic development of the state.

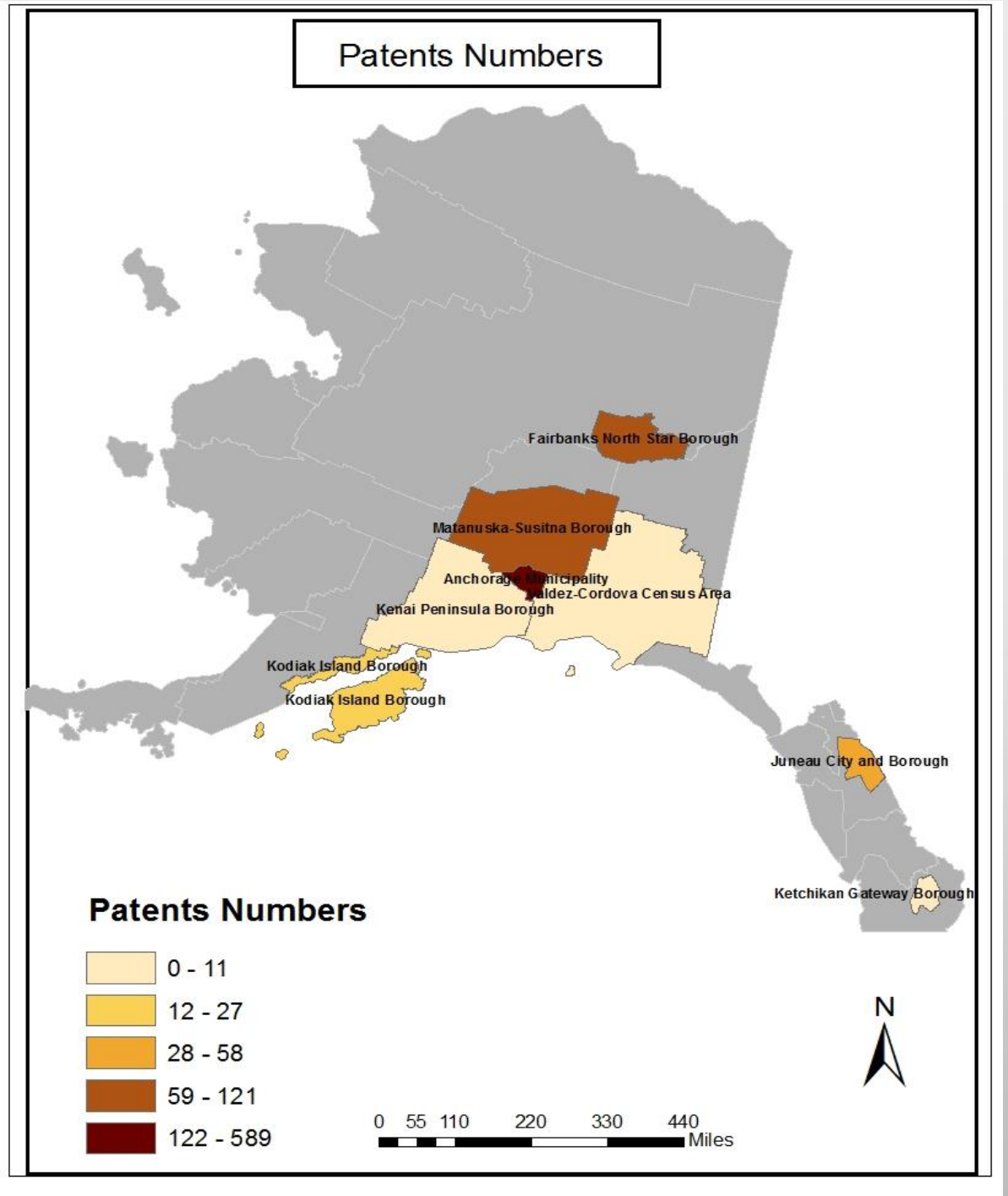
Literature Review

Patents Analysis

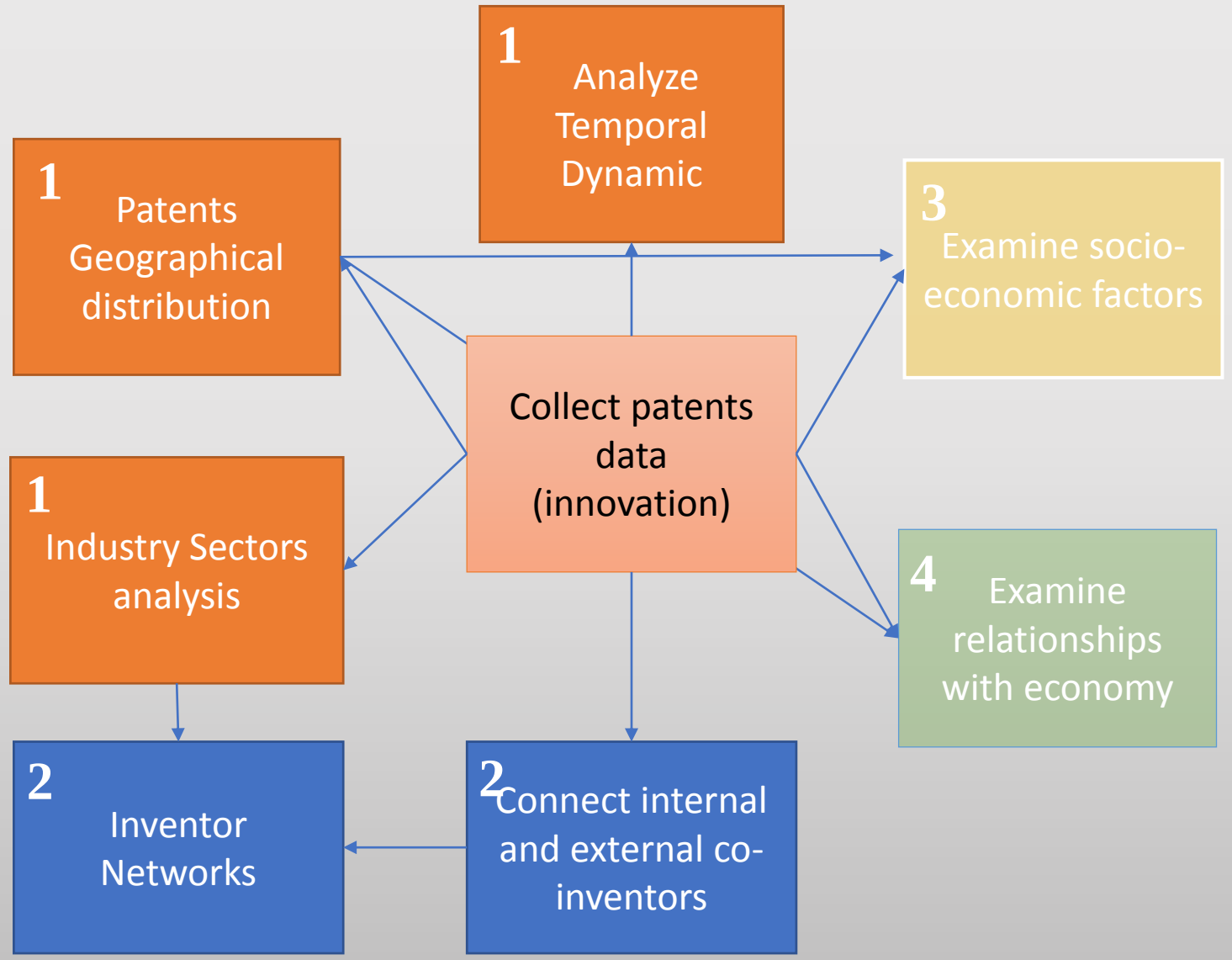
- A primary tool to study innovation
- Patents are usually considered as a representing knowledge economy output (Feldman, 2000).
- In the USA, patents granted by US Patent and Trademark office (USPTO) depends on examining inventions (Kogler, 2014).
- Number of patents in a certain area refers to the knowledge economy ‘outcomes’ in that area
- Patents have been known as an indicator of innovation and R&D process (Henderson R. et al, 1993).

Study Area

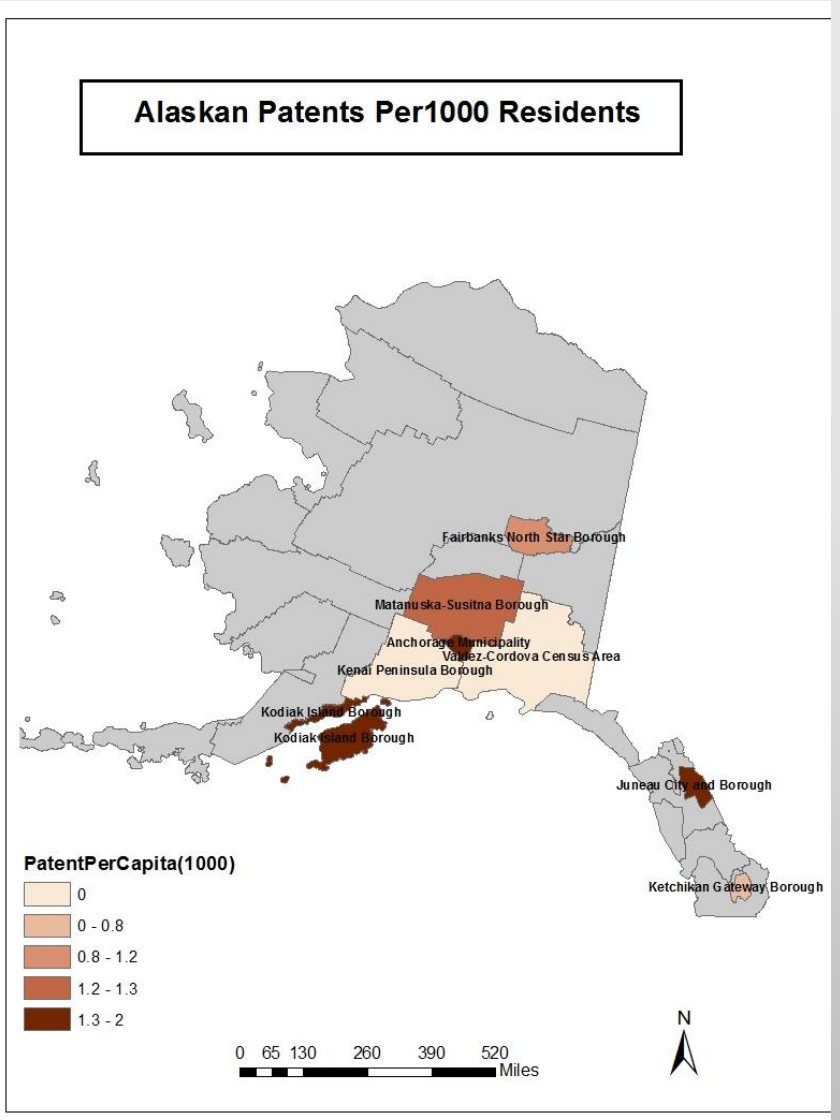
- The research study area is Alaska Boroughs that have a record of patented innovations.
- 8 Boroughs recorded patent counts totaling 1,077 patents created by 1,870 inventors between 1976-2010.
- The top *three cities* have largest number of patents in AK:
  - Anchorage
  - Fairbanks
  - Wasilla



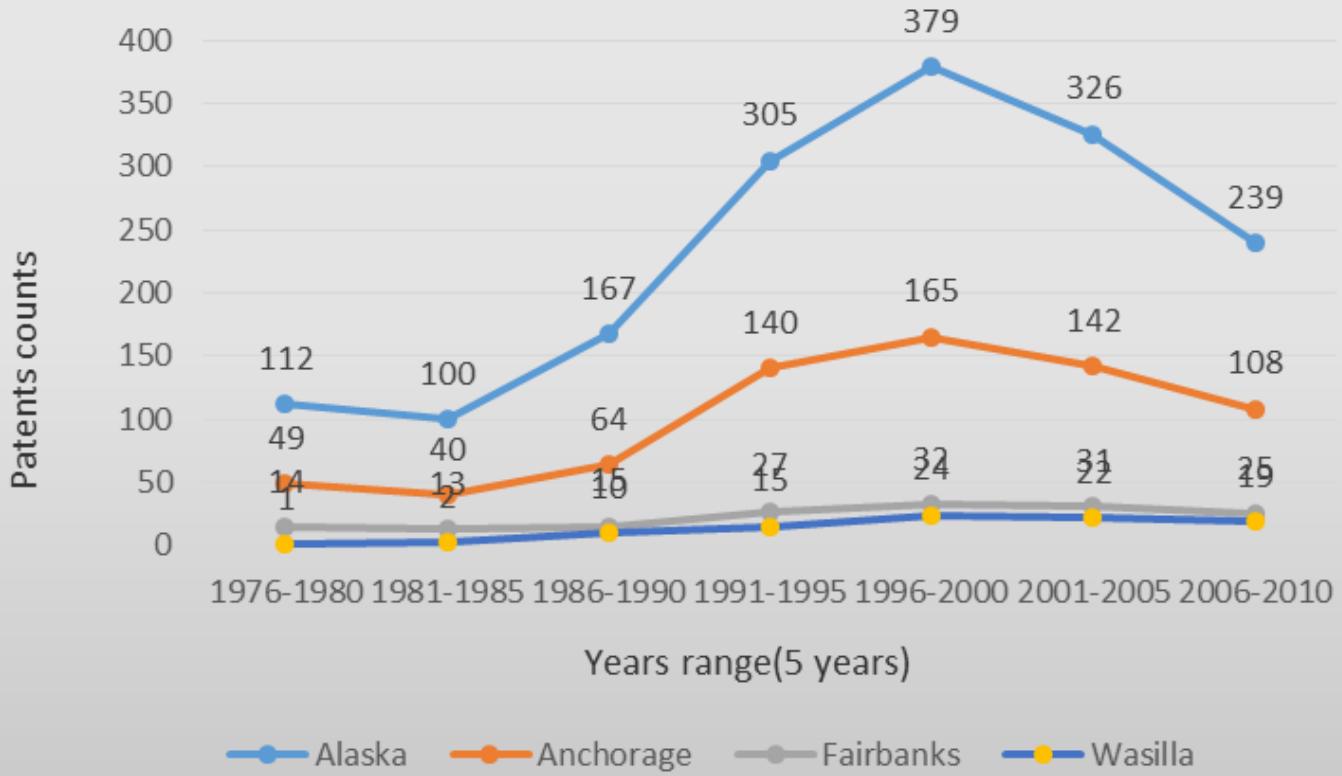
Methodology



Results

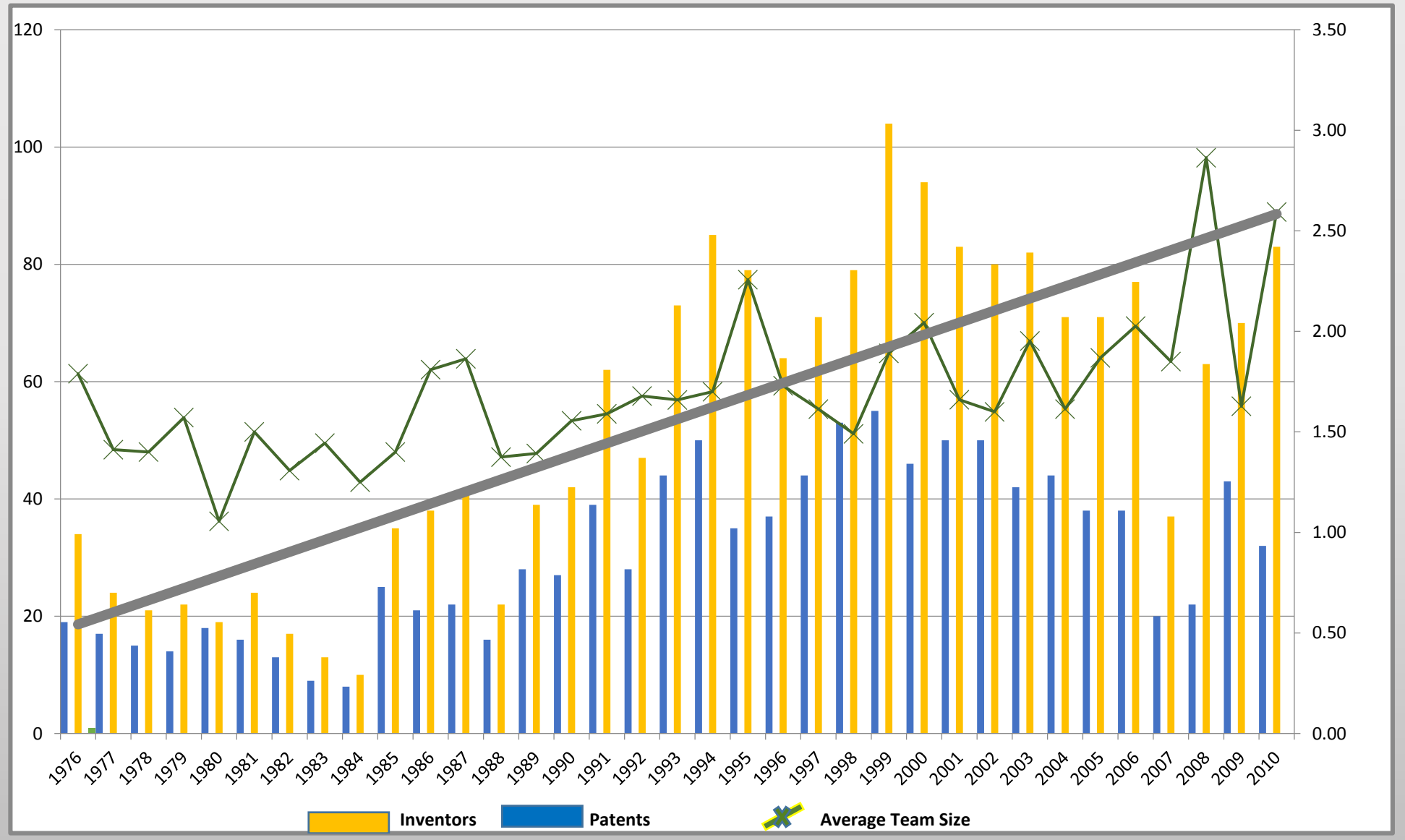


- The results show that Alaska has considerable patent activity, especially in some locations.

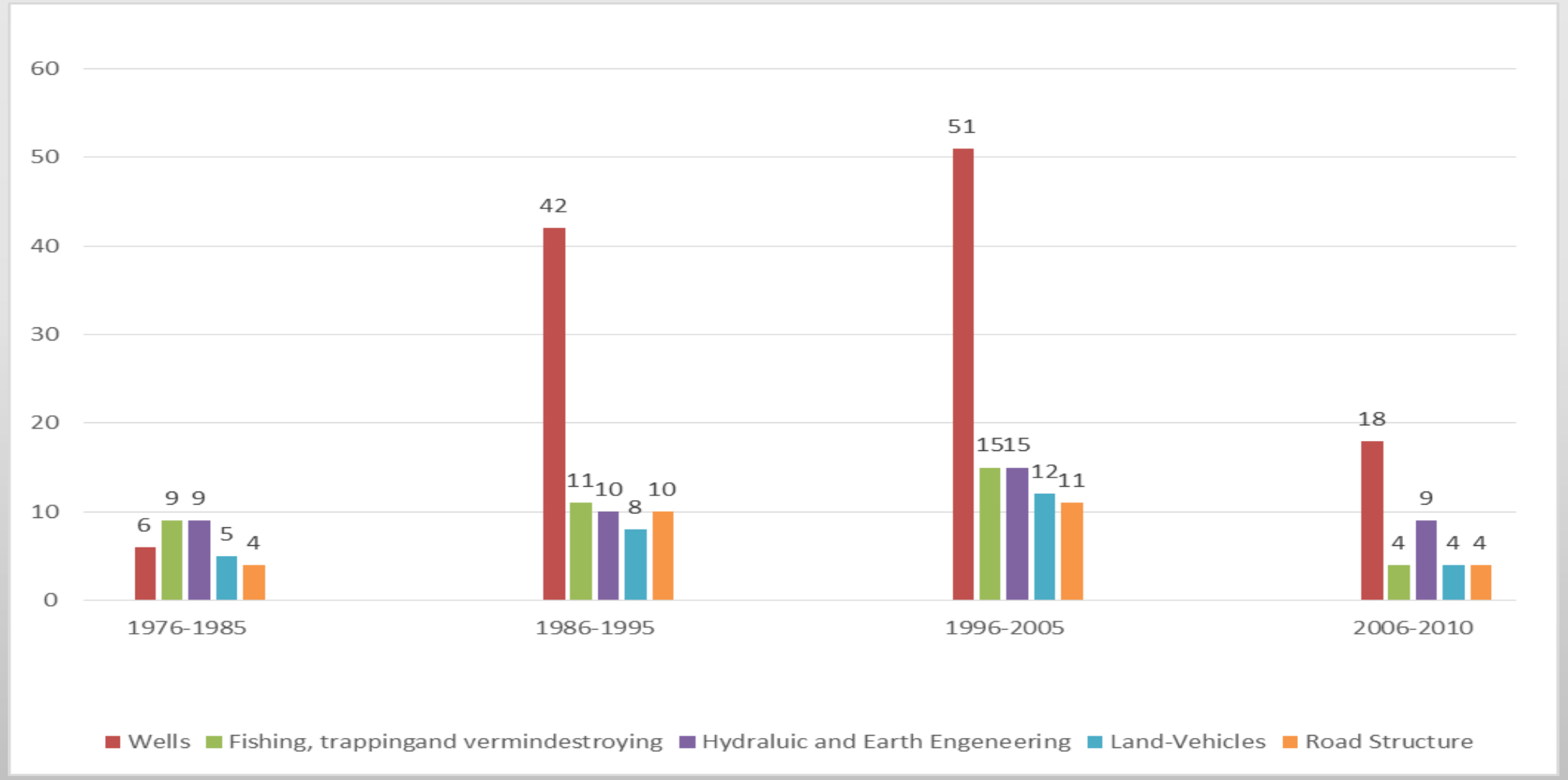


- Anchorage, Fairbanks, and Wasilla lead in the number of patents granted between 1976 to 2010.

Annual Number of Patents and Inventors, and Average Team Size per Patent.



Top Patented Industry Sector in Alaska



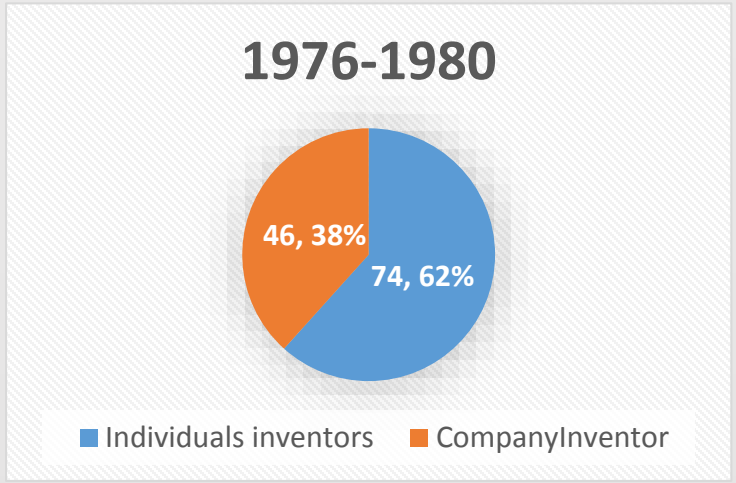
Location quotients of sectoral patent output from 1976-2010

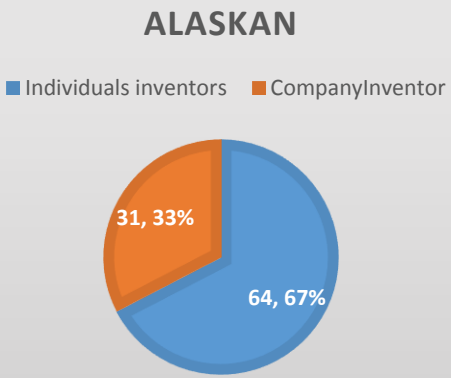
$$LQ_i^j = A_i^j / \sum_{i=1}^{n} (A_i^j) \Big| \Big/ B_i^j \sum_{i=1}^{n} (B_i)$$

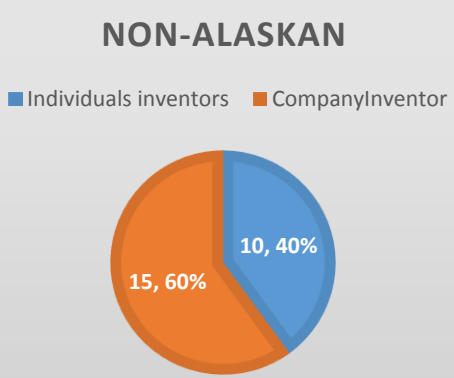
- If LQ =1 industry has the same share of activity as it does in the reference area.
- If LQ>1 reflects the relative concentration of specific activity in the region compare to nation.
- If LQ<1 reflects that the sector is underrepresented of the region of interest compare to national share.

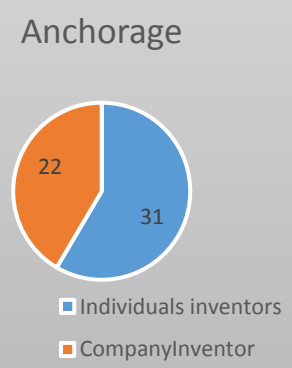
IndustrySector	Anchorage Municipality	Faribanks North Star Borough	Ketchikan Gateway Borough	Juneau City and Borough	Matanuska_Susitna Borough	Valdez-Cordova Census Area	Keni Peninsula	Kodiak Island Borough	Total# of patents(1976-2010
Wells	17.9	0	0	0	12.1	0	0	4.9	117
Hydraulic	12.8	17.2	0	0	2.2	0	0	9.6	43
Surgery	3.5	0	7.2	0	0	0	0	0	30
Liquid purification or seperation	1.9	2.6	0	1.4	0.7	0	0	0	24
Land Vehicles	1.9	0.8	0	1.7	9.1	0	0	0	24
Boring or penetrating the earth	7.4	2.4	0	0	2.4	0	0	0	21
Fishing	5.1	6.3	34.4	26.1	6.3	0	0	56.0	21
Data- processing- measuring ,Calibrating or testing	1.2	1.9	0	0	2.9	0	0	0	17
Drug, bio-affecting and body treating compositions	1.2	0.4	0	1.6	0.4	0	0	0	16
Measuring and testing	0.7	1.0	0	1.0	0	0	0	0	15
Ships	4.4	0	0	9.8	2.4	0	0	10.6	14
Animal husbandry	2.8	2.3	0	23.9	2.3	0	0	10.3	14
Supports	1.3	2.3	0	0	1.5	0	0	0	14
Static Structure	1.0	0.8	0	0	2.5	0	0	3.7	13
Geometrical Instruments	2.9	6.0	0	8.3	2	0	0	0	13
Exercise devices	2.5	0	0	0	15.4	0	0	27.4	12
package and article carriers	2.9	5.6	0	5.9	8.5	0	0	0	11
MultiplexCommunications	0.3	0	0	0	2.3	0	0	0	11
Communications: Electrical	0.8	0.5	0	0	0.5	0	0	0	11
Marine Propulsion	5.2	12.7	69.9	0	0	0	0	28.5	10
Internal - composition engines	1.2	0	0	0	4.9	0	0	0	10
Amusement Devices: games	1.9	3.8	0	3.9	1.9	0	0	8.4	10
Material or article handling	1.7	1.2	0	0	1.2	0	0	0	9
Fluid handling	0.8	3.7	0	0	0	0	0	0	9
Refrigeration	0.7	2.3	0	0	2.4	0	0	5.3	9

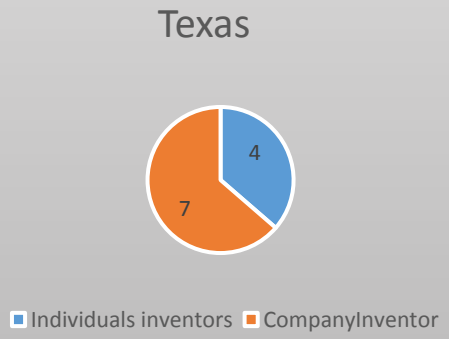
1976 -1980 CO-Inventors Network

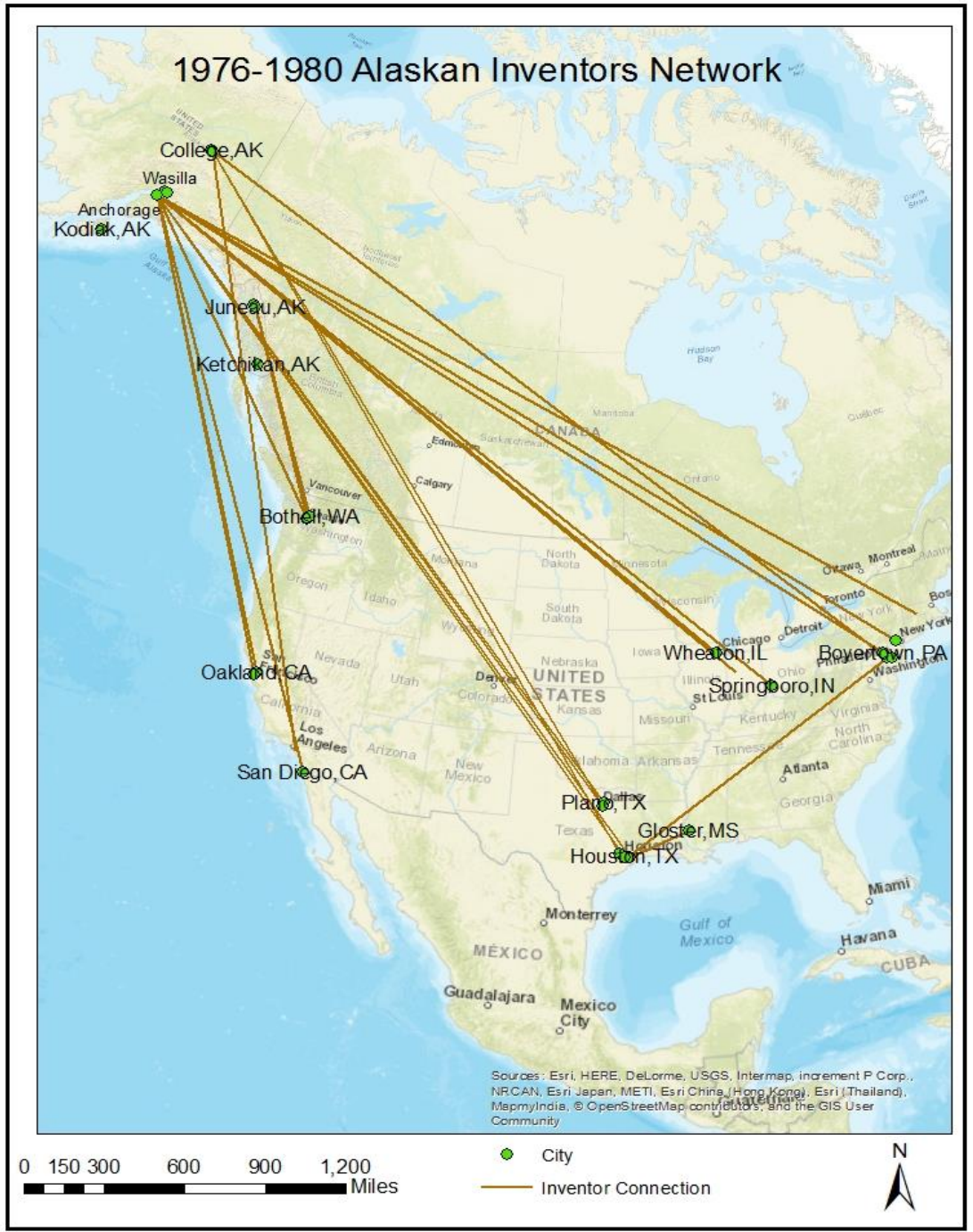




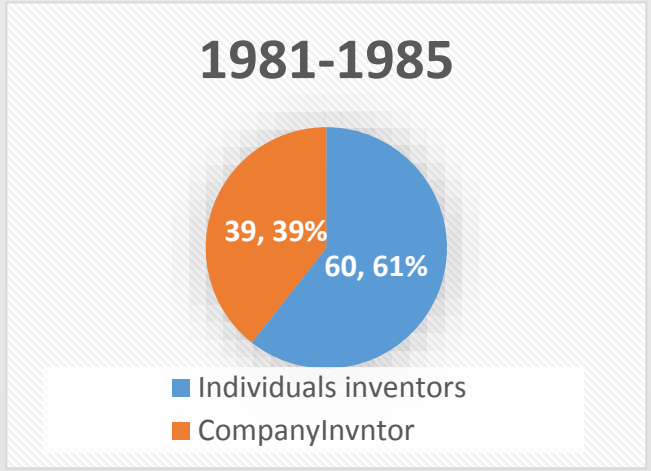








1981- 1985 Co-Inventors Network



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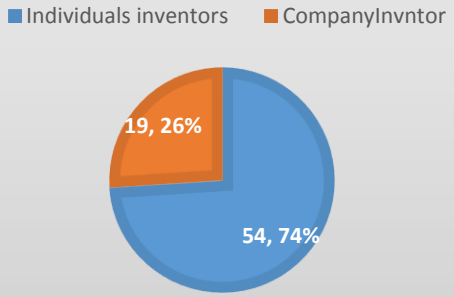

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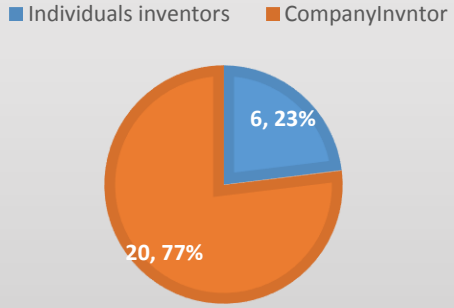

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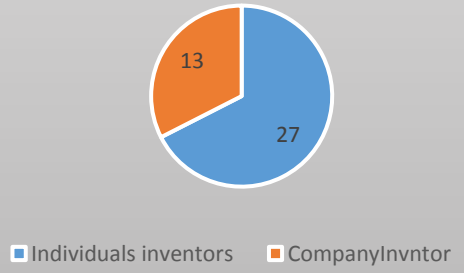
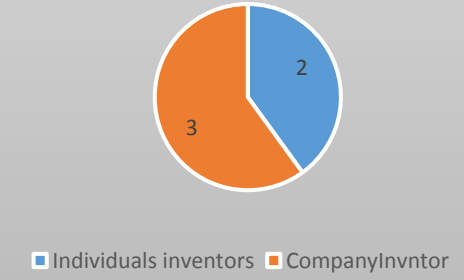
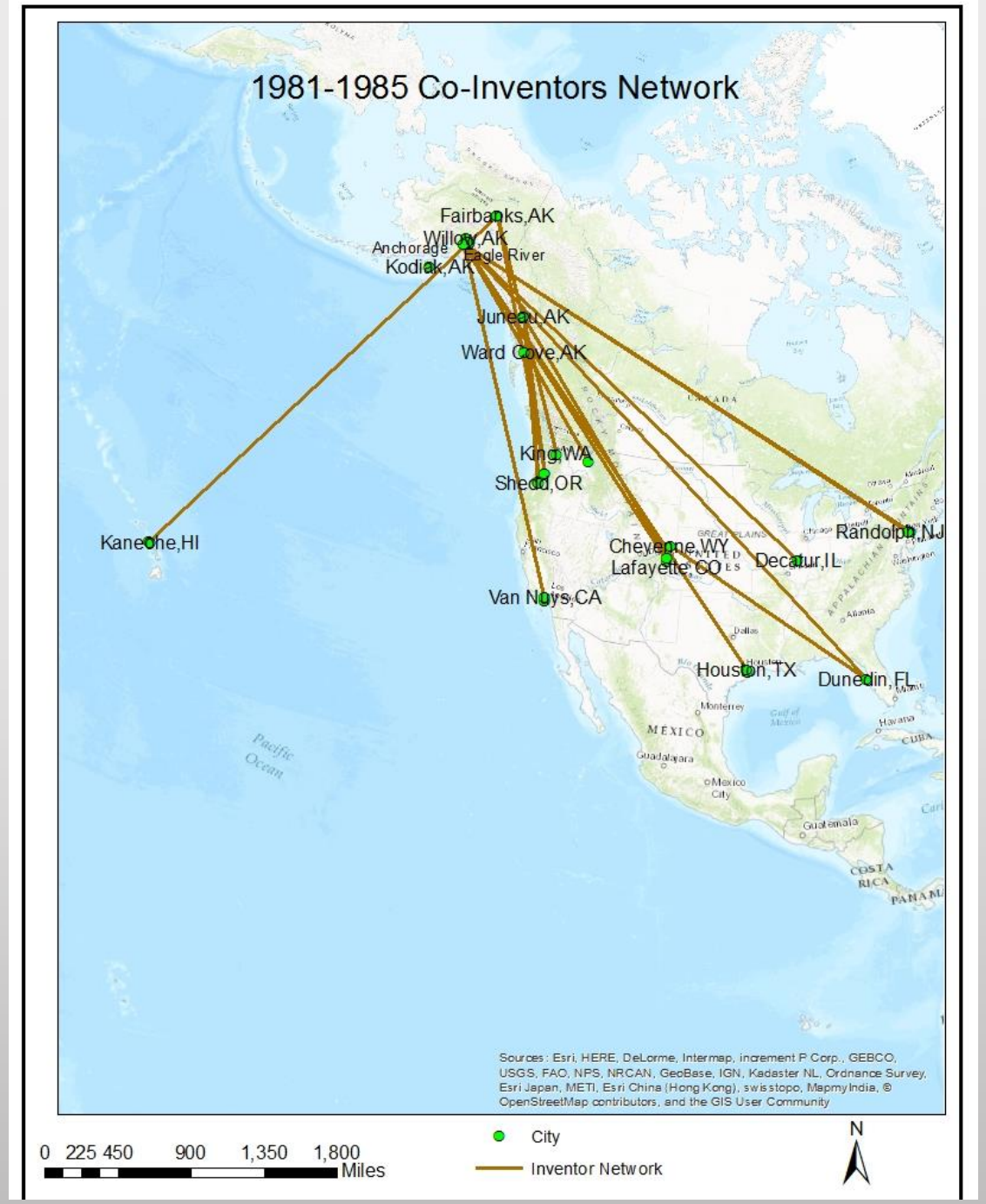
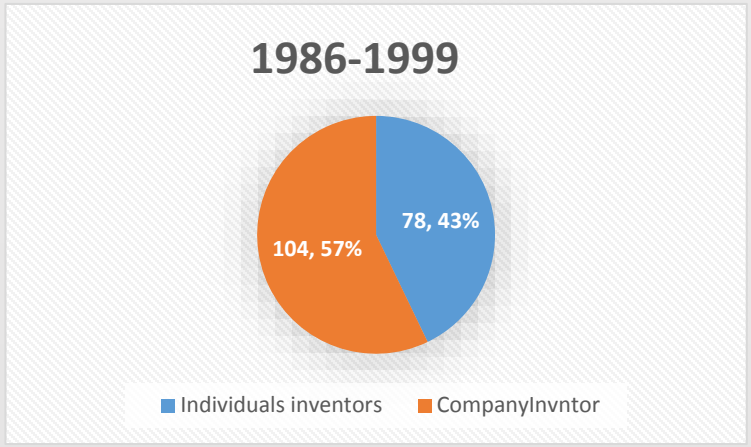


Oregon





1986-1990 Co-Inventors Network



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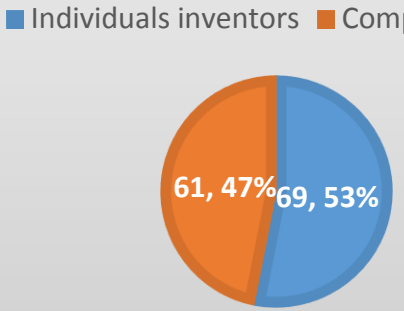

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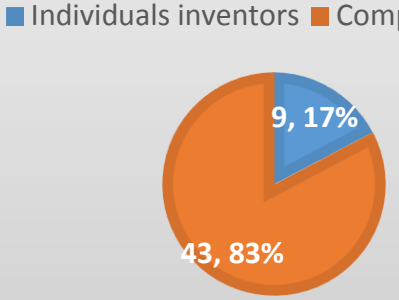

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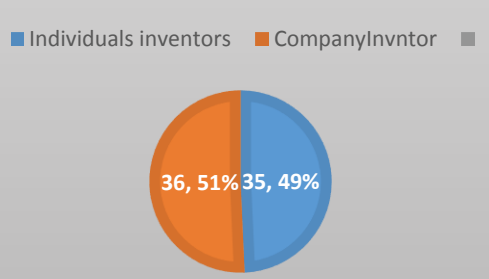

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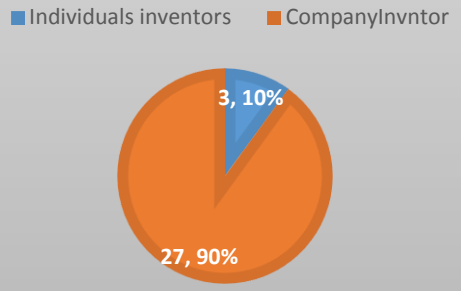
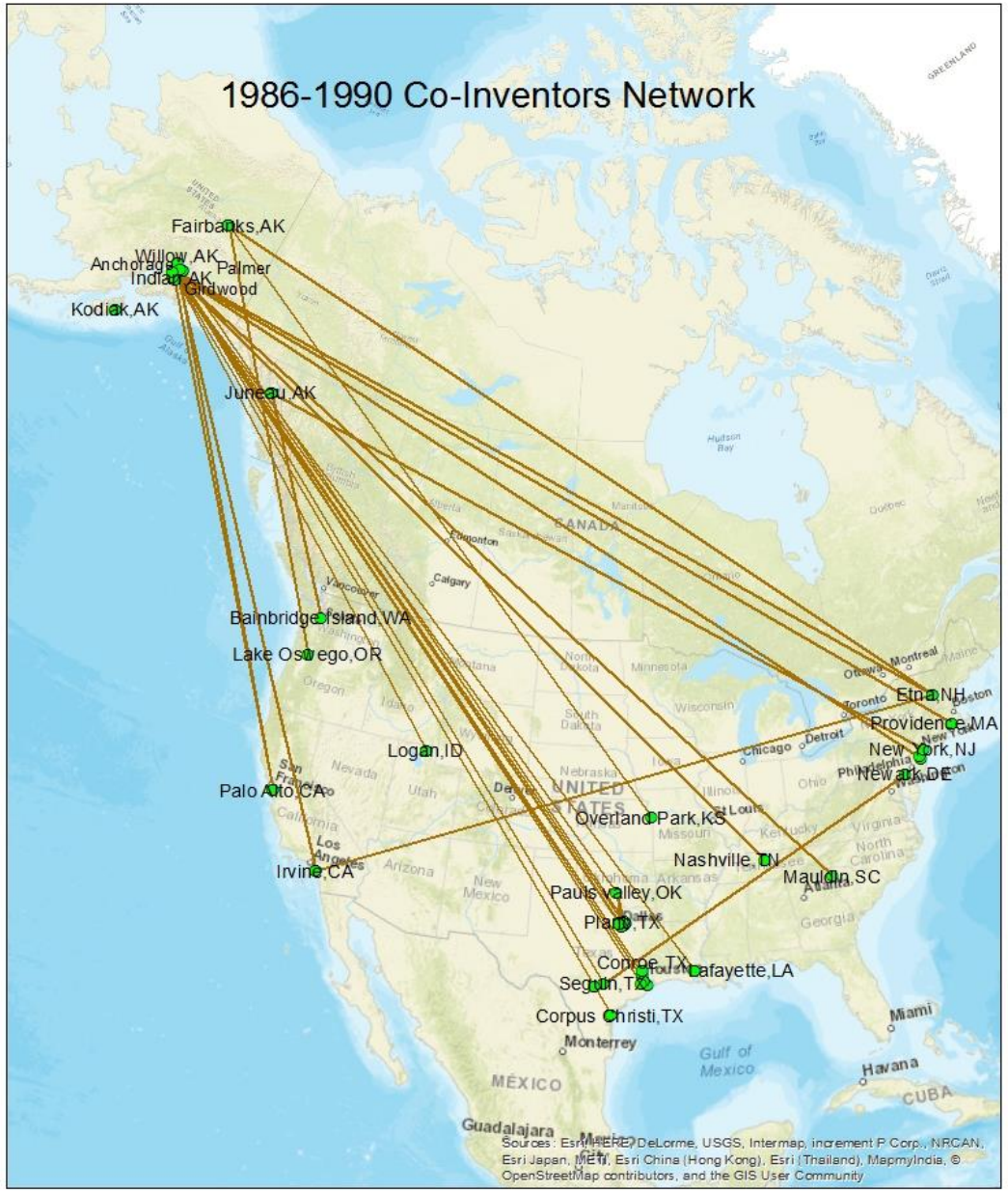
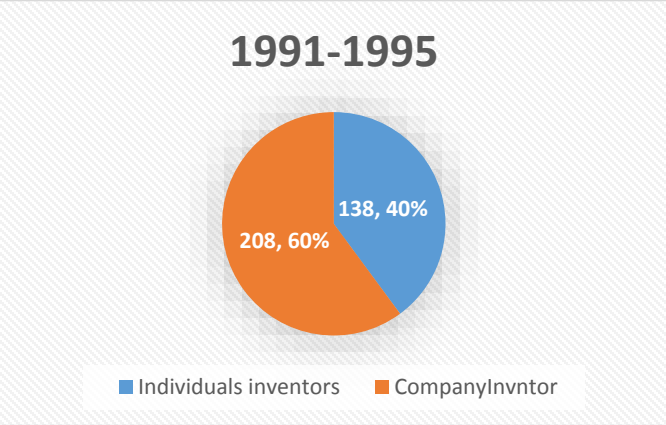




1991- 1995 CO-Inventors Network



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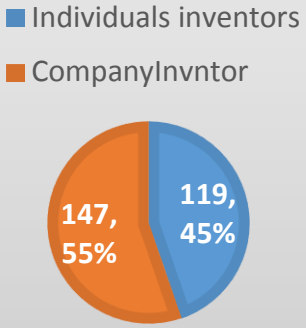

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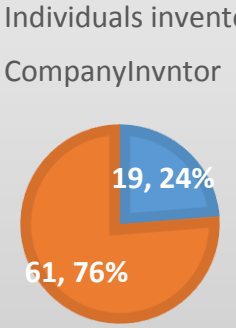

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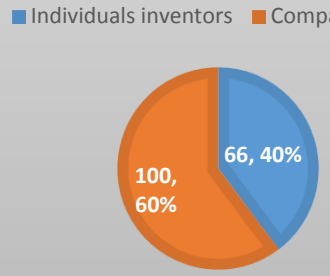

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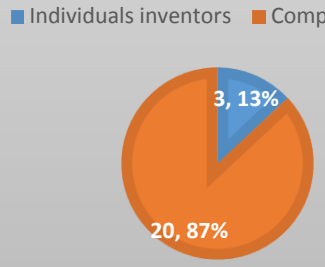
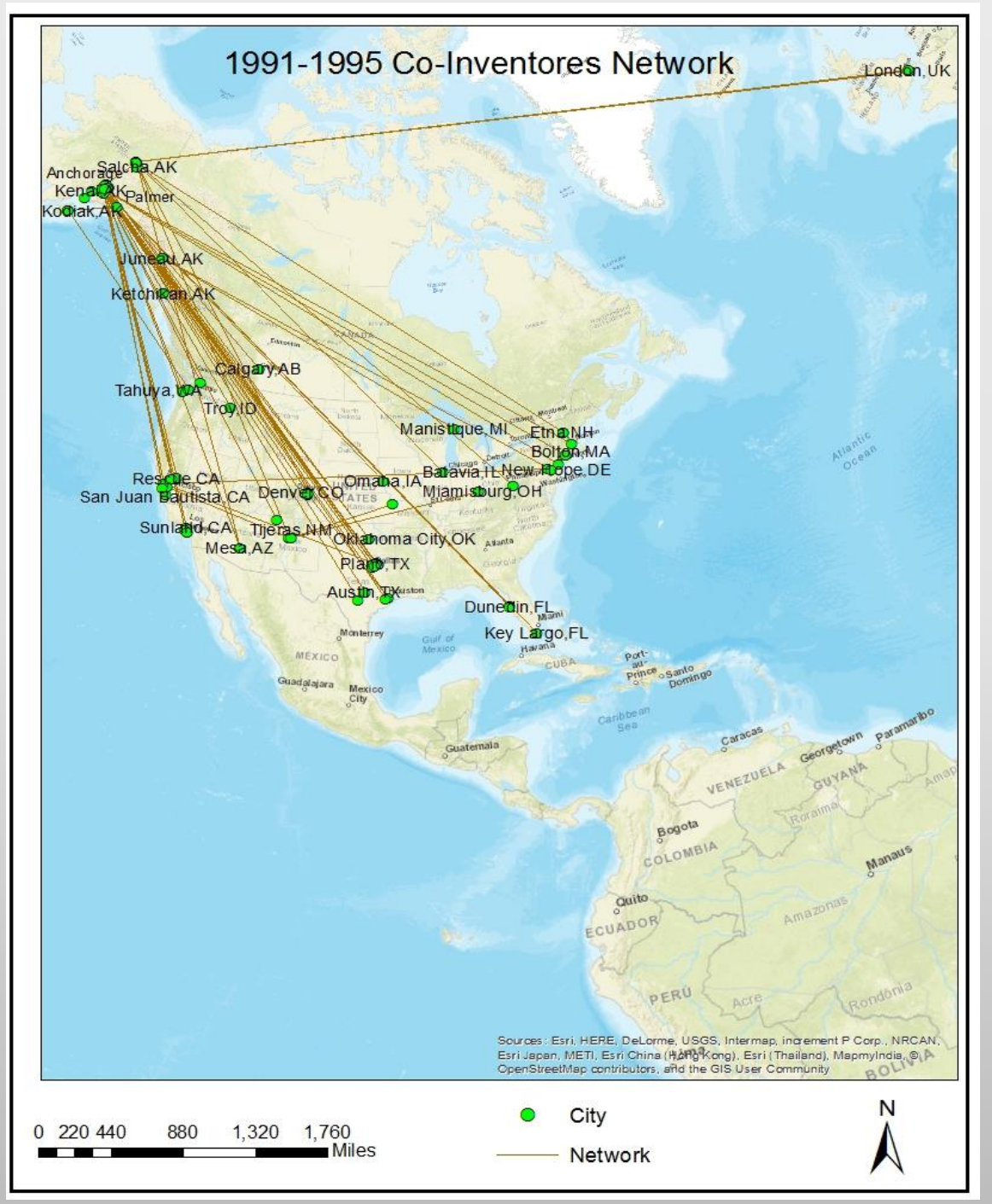
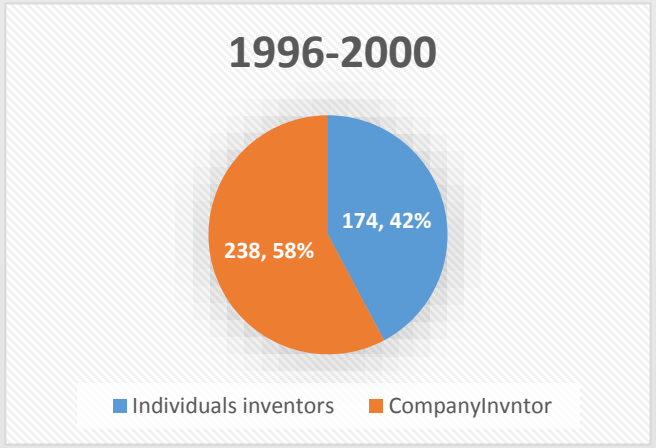




1996 – 2000 Co-Inventors Network



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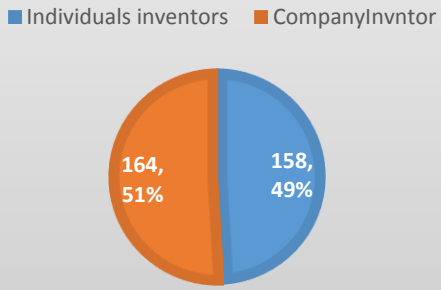

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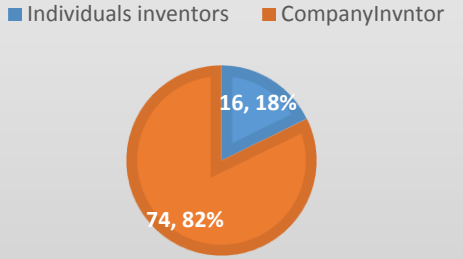

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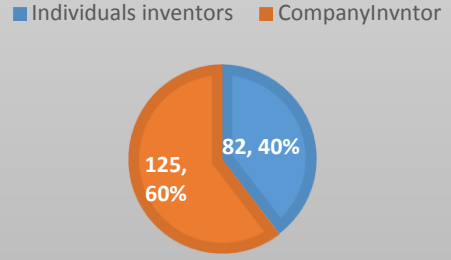

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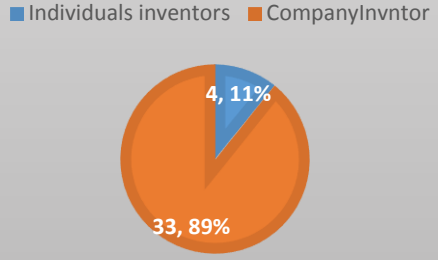
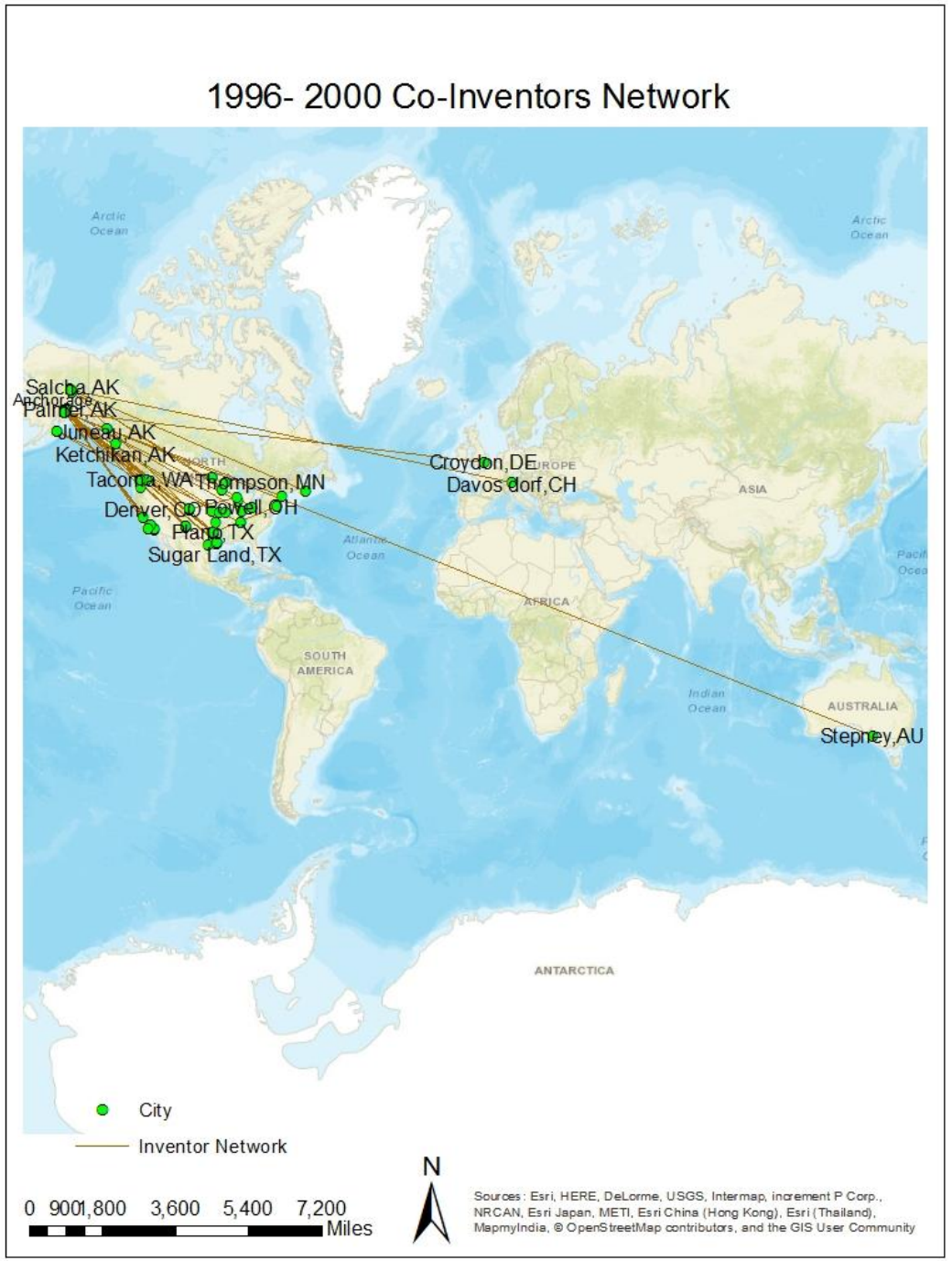
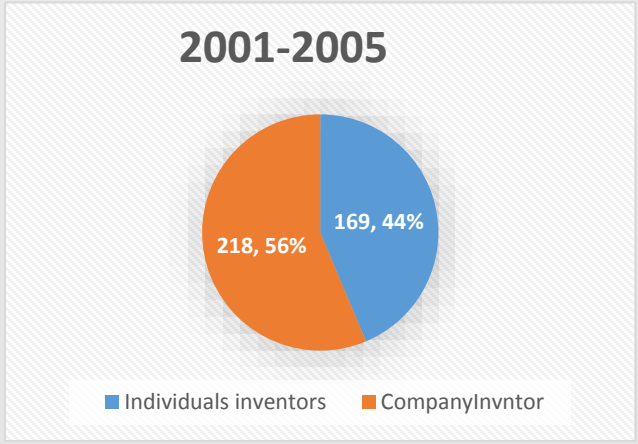




2001- 2005 Co-Inventors Network



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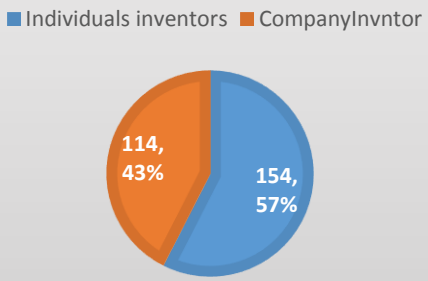

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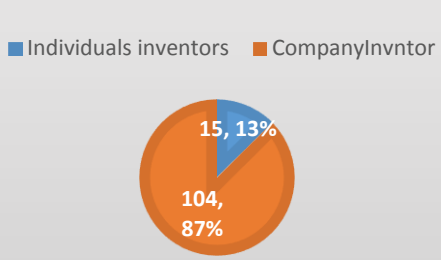

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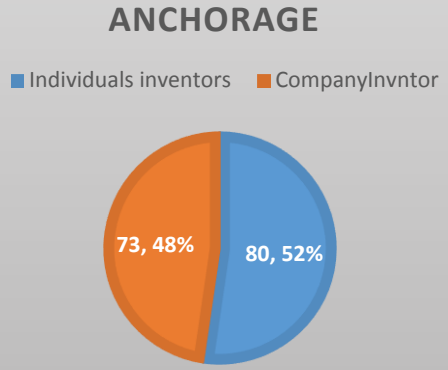

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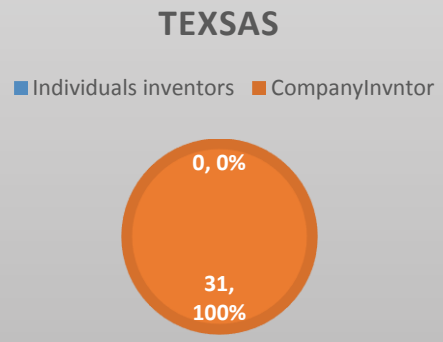
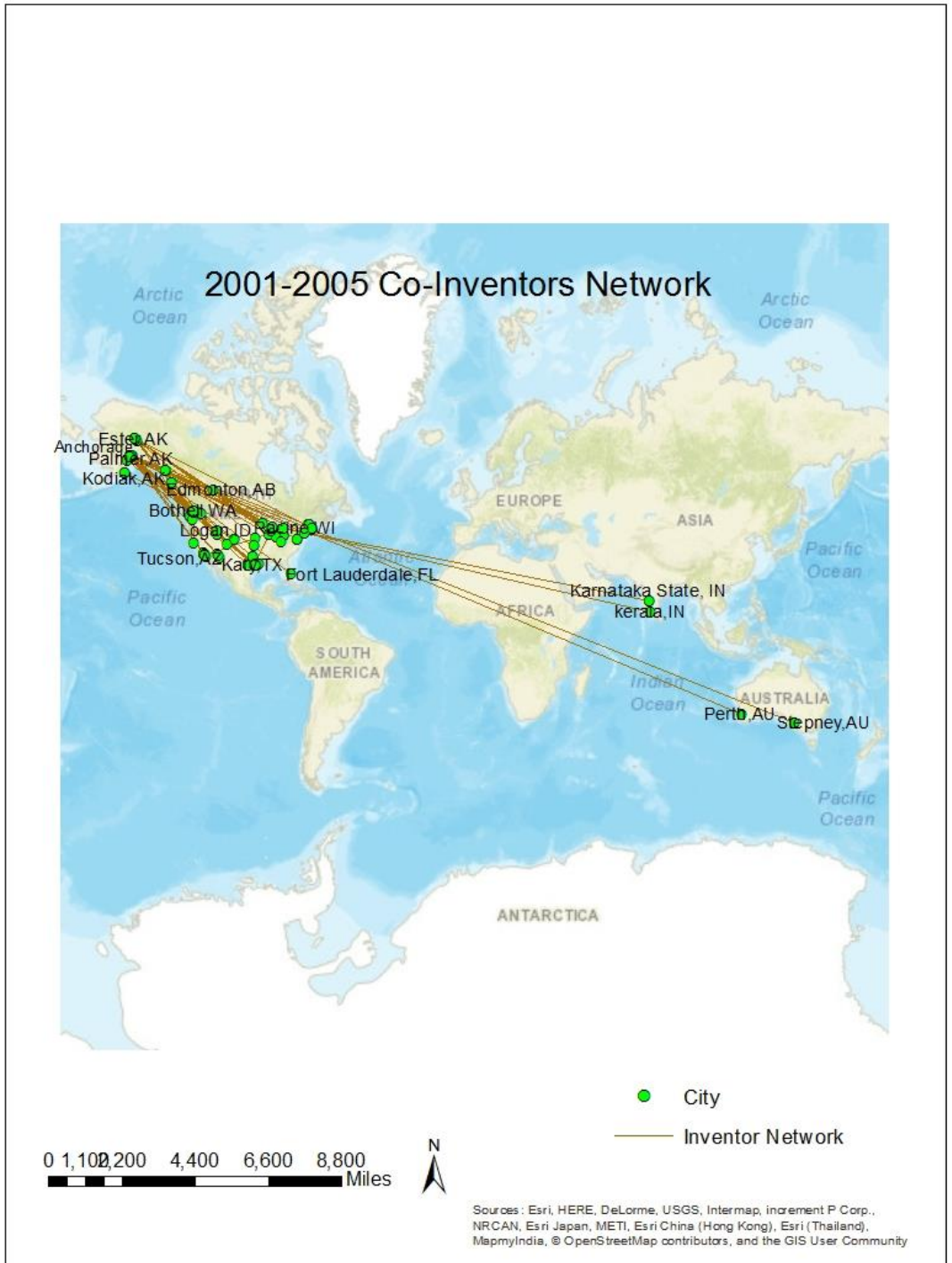
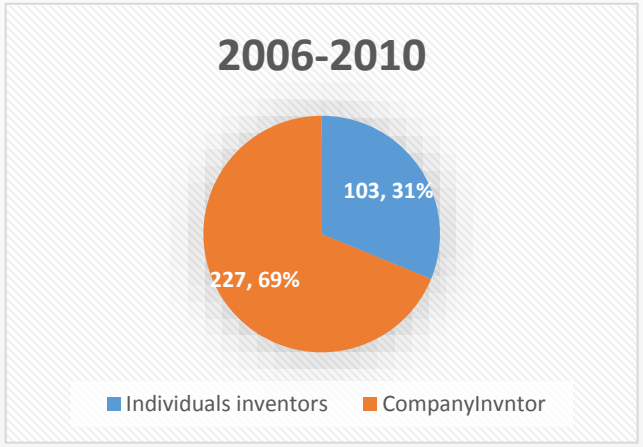
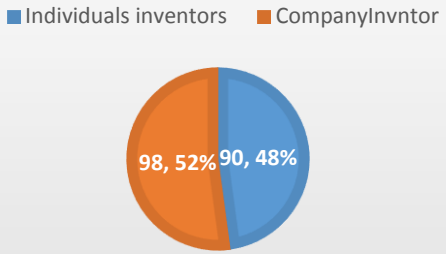




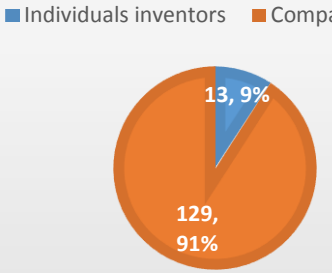
2006 -2010 Inventors Network



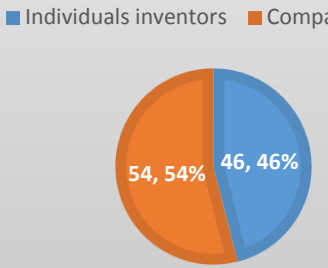
ALASKAN



NON-ALASKAN



ANCHORAGE



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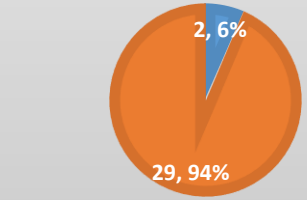

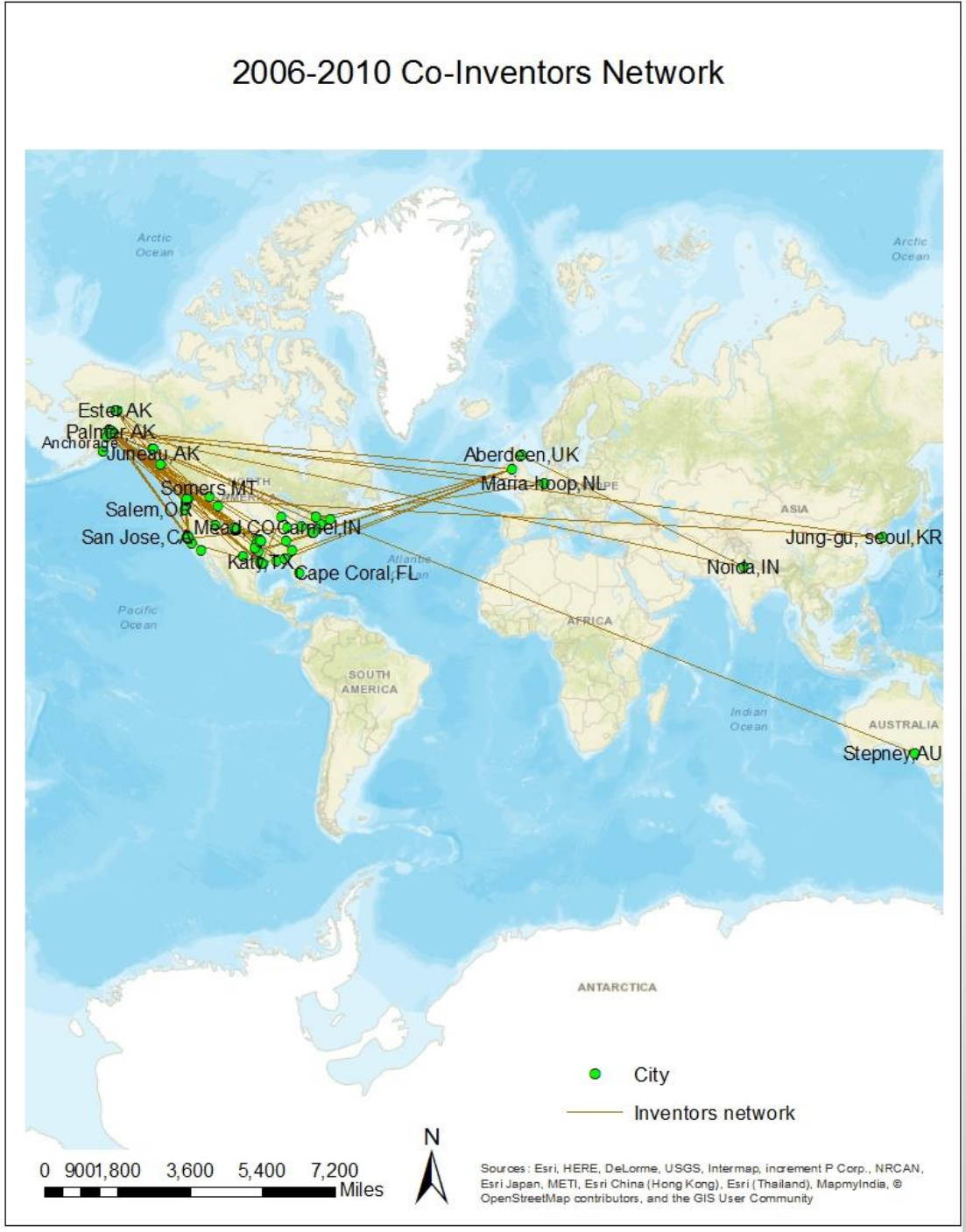

Conclusions

- The results show that Alaska has considerable patent activity especially in some fields.
- Wells industry sector was dominant by the patents number comparing with other industry sector.
- New industry sectors have recorded patents recently like data processing industry sector and surgery sector.
- Co-inventors network have been expanding over the time and the percent of patents share from external regions increased and diversified.
- Organizations (big outside companies) have a dominating effect on patents and innovation process.
- Alaska RIS evolved from an isolated system almost exclusively represented by individual inventors and small teams to a relatively diversified large-team based externally-connected RIS

Acknowledgments

Dr. Dieter F. Kogler, University College Dublin
Dr. Lee Huskey, University of Alaska Anchorage

Thank you